

CLAIMS

1. A reflow soldering method using a Pb-free solder alloy, comprising soldering a surface mounting component to an upper surface or a lower surface of a circuit board by using a Pb-free solder paste comprising an alloy based on Sn-(1-4)Ag-(0-1)Cu-(7-10)In (unit: mass%).

2. The reflow soldering method using a Pb-free solder alloy according to claim 1, wherein Pb-free plating is applied to a lead of the surface mounting component.

3. The reflow soldering method using a Pb-free solder alloy according to claim 2, wherein the Pb-free plating is Sn plating or Sn-Bi plating.

4. A hybrid mounting method using a Pb-free solder alloy, comprising:

a reflow soldering step of soldering a surface mounting component to at least an upper surface of a circuit board using a Pb-free solder paste comprising an alloy based on Sn-(1-4)Ag-(0-1)Cu-(7-10)In (unit, mass%);

an insertion step of inserting a lead or a terminal of an insertion mounting component into a through hole perforated through the circuit board from an upper surface thereof;

a flux coating step of coating a flux to the circuit board after inserting the lead or the terminal of the insertion mounting component into the through hole perforated

through the circuit board in the insertion step;

a pre-heating step of pre-heating a lower surface of the circuit board after coating the flux to the circuit board in the flux coating step; and

a flow soldering step of applying a jet flow of Pb-free solder to the lower surface of the circuit board preheated by the preheating step, thereby flow soldering the lead or the terminal of the insertion mounting component to the circuit board.

5. The hybrid mounting method using a Pb-free solder alloy according to claim 4, wherein Pb-free plating is applied to the lead of the surface mounting component in the reflow soldering step.

6. The hybrid mounting method using a Pb-free solder alloy according to claim 5, wherein the Pb-free plating is Sn plating or Sn-Bi plating.

7. The hybrid mounting method using a Pb-free solder alloy according to claim 4, wherein the Pb-free solder has an eutectic composition of Sn-Cu series, Sn-Ag series, Sn-Ag-Cu series, Sn-Ag-Bi series or a series with addition of In thereto, or a composition approximate to said eutectic composition in the flow soldering step.

8. The hybrid mounting method using a Pb-free solder alloy according to claim 5, wherein the Pb-free solder has an eutectic composition of Sn-Cu series, Sn-Ag series, Sn-Ag-Cu

series, Sn-Ag-Bi series or a series with addition of In thereto, or a composition approximate to said eutectic composition in the flow soldering step.

9. The hybrid mounting method using a Pb-free solder alloy according to claim 7, wherein a temperature of the jet flow of the Pb-free solder is within a range from 170°C to 260°C in the flow soldering step.

10. The hybrid mounting method using a Pb-free solder alloy according to claim 8, wherein the temperature of the jet flow of the Pb-free solder is within a range from 170°C to 260°C in the flow soldering step.

11. The hybrid mounting method using a Pb-free solder alloy according to claim 7, wherein an upper surface of the circuit board is cooled by blowing fluid at 50°C or lower thereto in the flow soldering step.

12. The hybrid mounting method using a Pb-free solder alloy according to claim 8 wherein an upper surface of the circuit board is cooled by blowing fluid at 50°C or lower thereto in the flow soldering step.

13. The hybrid mounting method using a Pb-free solder alloy according to claim 11, wherein a flow rate of the fluid is from 0.3 to 1.2 m³/min in the flow soldering step.

14. The hybrid mounting method using a Pb-free solder alloy according to claim 12, wherein a flow rate of the fluid is from 0.3 to 1.2 m³/min in the flow soldering step.

15. The hybrid mounting method using a Pb-free solder alloy according to claim 11, wherein a heat dissipation jig is mounted to be in contact with a connection portion of the surface mounting component in the flow soldering step.

16. The hybrid mounting method using a Pb-free solder alloy according to claim 12, wherein a heat dissipation jig is mounted to be in contact with a connection portion of the surface mounting component in the flow soldering step.

17. A hybrid mounted structure hybridly mounted by using the hybrid mounting method using a Pb-free solder alloy according to claim 4, 5, 7 or 8.